REMARKS

The Applicants thank the Examiner for the examination to date and respectfully request reconsideration.

Claims 1, 2, 7, 14, 17, 19, 21, 23-27, 34-41, 44, 46, 52, 55, 57, 59, 61-65, 71-72, 80-85, 87-92, 94-99, 110-115, and 117-140 were rejected in the May 28, 2008 office action.

In this Amendment, independent claim 1 and other independent claims 40, 90, 110-112, and 120 are amended to include a depositing rate. Support for this amendment can be found in the filed application, as published, at paragraph 113 and claim 123 in the publication. Independent claim 123 is amended to recite a nanoscopic tip deposition which is supported by many of the original filed claims including claim 14. If the Examiner believes that any new matter issue is present, the Applicants request a telephone interview.

In this Amendment, numerous claims are cancelled without prejudice to simplify the issues and advance prosecution efficiently.

Following this Amendment, the independent claims are 1, 40, 90, 110-112, 120, and 123.

35 U.S.C § 112, 2nd Paragraph, Rejections

The Examiner has rejected independent claim 1 and other claims for allegedly omitting an essential step. The Applicants respectfully traverse. Because the Examiner referred to paragraph numbers in the Applicants' published application, the Applicants will do the same.

Claim 1 refers to "…hydrophilic compound to inhibit protein adsorption…" and this phrase is sufficiently clear in view of the specification and the knowledge in the art to satisfy 35 U.S.C § 112, 2nd Paragraph. In particular, the specification refers to a variety of technical

literature which establishes what is known in the art, and the Applicants use claim terms which would be understood by one skilled in the art.

For example, paragraph 95 describes an embodiment for tip modification including use of PEG or more particularly PEG silanes (Si-PEG) and refers to reference citations A10a and A11 for further description. Paragraphs 96-101 also provide additional citations to the literature. Working example 1 at paragraphs 108-117 provide additional descriptive support for the claim language.

In addition, working example 2 beginning at paragraph 118 provides an additional embodiment. In this embodiment, PEG is used to coat the back side of a cantilever: "This resulted in the formation of a monolayer of PEG that prevents adsorption of protein (see reference A3b and A10) on the reflective Au surface of the cantilever (back side)." (paragraph 119). Again, the specification refers to technical literature to support the description. The tips were then treated with a component which is adapted to facilitate protein adsorption, and the specification refers to references A4a and A11 to support its description.

The specification also refers to use of PEG to passivated the substrate surface against protein absorption. See, for example, paragraph 120.

In other words, while the Applicants describe different embodiments in Examples 1 and 2, no inconsistency is present in the different embodiments which generates an issue. The Applicants' position regarding compliance with 112, paragraph two is also deemed to apply to other independent and dependent claims rejected under this provision.

In sum, if the Examiner believes that an issue remains, the Applicants respectfully request a telephone interview to resolve the matter efficiently.

35 U.S.C § 103 Rejections

The Examiner has rejected claim 1 and other independent claims (and dependent claims) because allegedly the subject matter would have been obvious in view of the combined teachings of Mirkin (WO 00/41213) and Bernard (2002/0098364). The applicants respectfully traverse. Briefly, no prima facie case of obviousness is present because, among other things, the references teach away, no motivation is present to combine references, and the references do not address the problem facing the inventors. Even if prima facie obviousness is assumed to exist for sake of argument, the Applicants can rebut because they have demonstrated unexpected results.

First, the Applicants stress from the start the unexpected results. The tip modifications as claimed herein enable fast deposition speeds which can be an issue for deposition of high molecular weight materials such as proteins. For example, speeds greater than 85 dots per four minutes per tip can be achieved (e.g., roughly three seconds or less contact/dwell time). Neither Mirkin nor Bernard suggest such deposition speeds, particularly for high molecular weight materials. The Applicants respectfully submit that the Examiner in the office action incorrectly discusses claim 123 suggesting a fast deposition speed in Mirkin at Mirkin page 21, lines 20-23. Mirkin did not print 25 dots in 20 seconds. Rather, Mirkin teaches taking 20 seconds to pattern each dot, so Mirkin is well outside the claim scope. Moreover, Mirkin teaches long contact times which can go up to 2, 4, and 16 minutes (see page 21, lines 12-15). These long contact times for low molecular weight patterning compounds like thiols suggest directly much longer contact times for proteins than presently claimed and teach away.

Mirkin teachings about tip modification do not teach or suggest such rapid printing as presently claimed. Rather, Mirkin focuses on tip modification to improve adherence via an adhesion layer.

Moreover, Bernard describes a stamping process which is not relevant to printing dots and patterns at a particular speed as presently claimed.

In sum, while the Applicants also argue against prima facie obviousness below, the unexpected results rebut any assumed prima facie obviousness.

Second, the claimed subject matter relates to solving problems with respect to protein patterning, wherein protein is transferred from the tip to a substrate in a commercially improved process including fast printing rates – a particularly challenging problem for protein and peptide printing. The primary reference Mirkin merely represents the problem facing the inventors, not a solution to the problem. The secondary reference Bernard describes and suggests nothing with respect to proteins. Hence, one skilled in the art would not be motivated to turn to Mirkin or Bernard, or to their combined teachings, to arrive at the claimed inventions.

Third, the references teach away. In particular, the primary reference Mirkin teaches away. While Mirkin describes generally deposition of a wide variety of patterning compounds, including proteins, Mirkin does not address specific problems and improvements associated with a commercial process for protein deposition, particularly issues such as reproducibility and patterning speed. Mirkin does not direct one of ordinary skill to focus on improved protein deposition including fast deposition rates.

Moreover, the technology described in Mirkin and presently claimed can be subtly complex because one needs to find a way initially to get the deposition material onto the tip, and then subsequently transfer that same material off of the tip. These issues can be more difficult with higher molecular weight materials such as proteins, because transport of compound from tip to surface can be regulated in part by diffusion, and diffusion processes are generally slower for larger molecular weight compounds such as proteins. Again, Mirkin does not address the particular issues found for protein patterning.

Furthermore, Mirkin teaches that tip modification can be carried out to form an adhesion layer so that physical adsorption of the patterning compound to the tip is enhanced. The applicants claim in particular claims that tip modification results in inhibition of the protein adsorption on the tip. Hence, Mirkin teaches away.

The secondary reference, Bernard, also teaches away because it focuses on modifications of stamps, not tips. In a tip, the patterning compound moves down the tip and away from the tip

onto the surface. In a stamp, the patterning compound does not move down the stamp. Tip transfer may be mediated by a meniscus, which is not how transfer is mediated with a stamp.

Finally, no motivation is present to combine references. Mirkin teaches a hard tip approach, wherein Bernard teaches a soft stamp approach. The teachings are not compatible as the chemistry in Bernard's surface modification cannot be used in Mirkin and vice versa. Moreoever, collectively, the references are not enabling to reach the claimed invention in view of the different chemistries for tip modification, which further suggests no motivation to combine..

In sum, no prima facie obviousness is present in this record, and even if it is assumed to exist for sake of argument, the Applicants rebut with unexpected results.

The Applicants have not addressed dependent claim 97 and the Duffy reference as this claim is allowable based on the parent. Claim 136 is cancelled so reference to Everhart is moot.

CONCLUSION

The Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing or a credit card payment form being unsigned, providing incorrect information resulting in a rejected credit card transaction, or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of

time are needed for timely acceptance of papers submitted herewith, the Applicants hereby petition for such extension under 37 C.F.R. § 1.136 and authorize payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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By _____

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